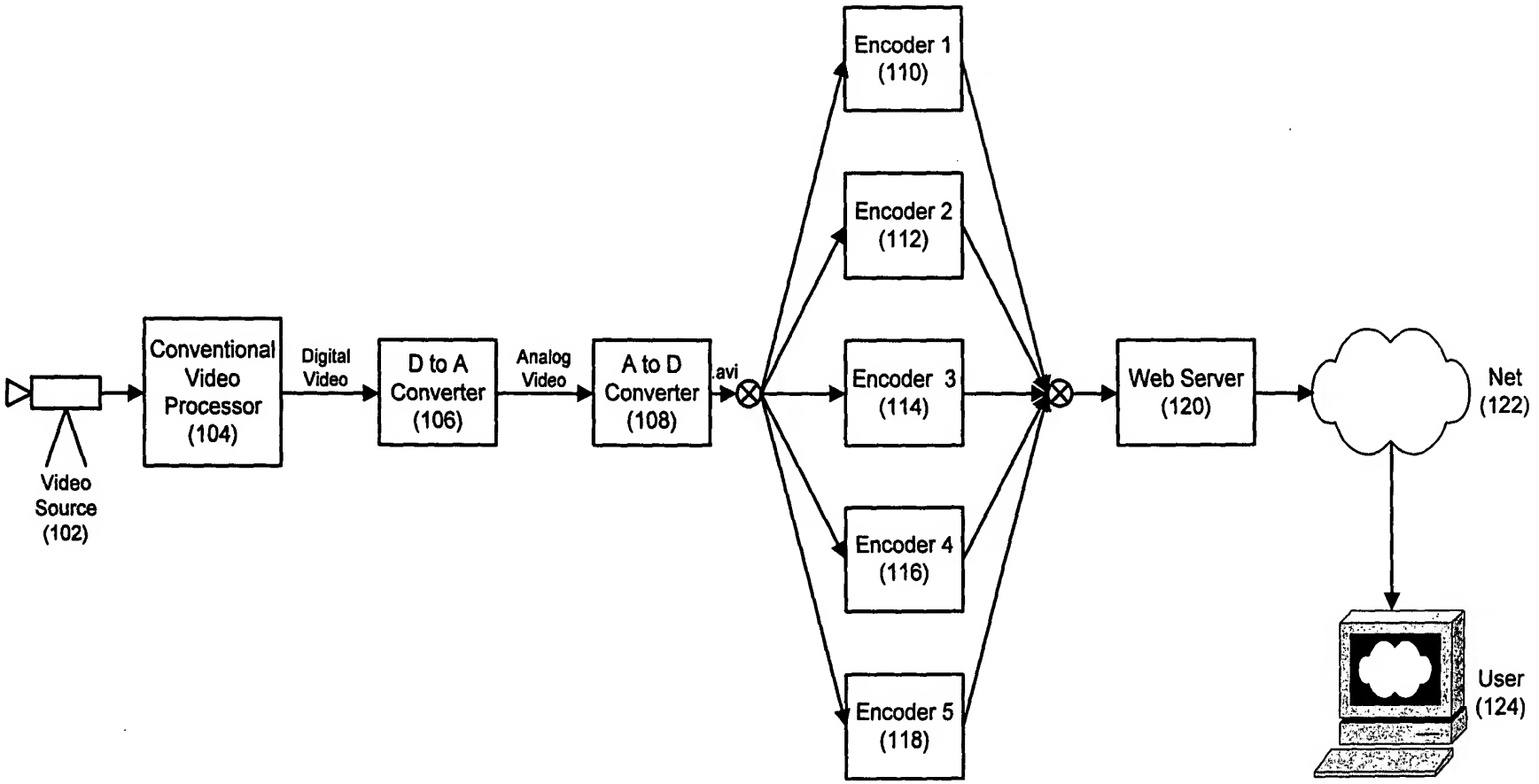

Fig. 1A (prior art)

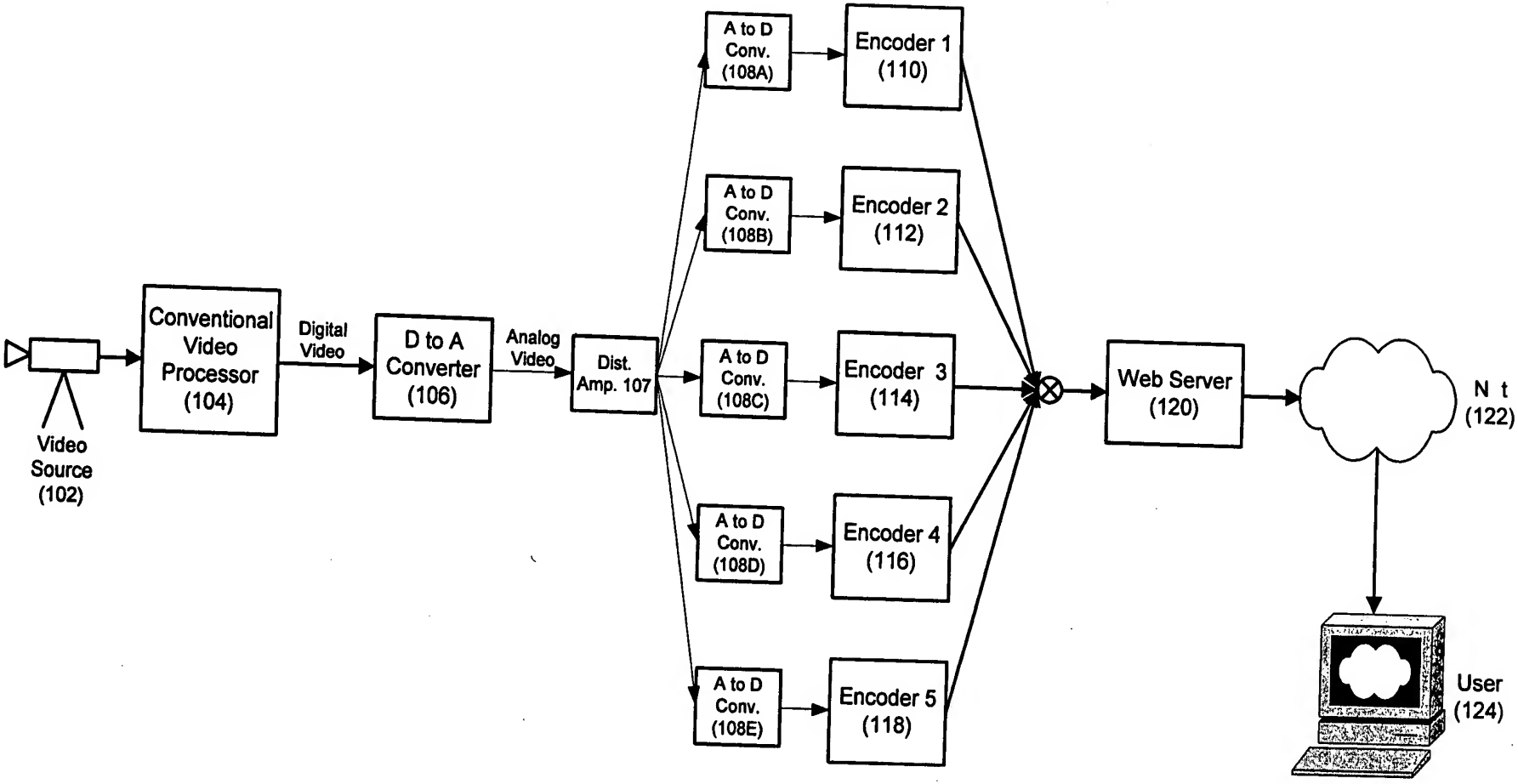

Fig. 1B (prior art)

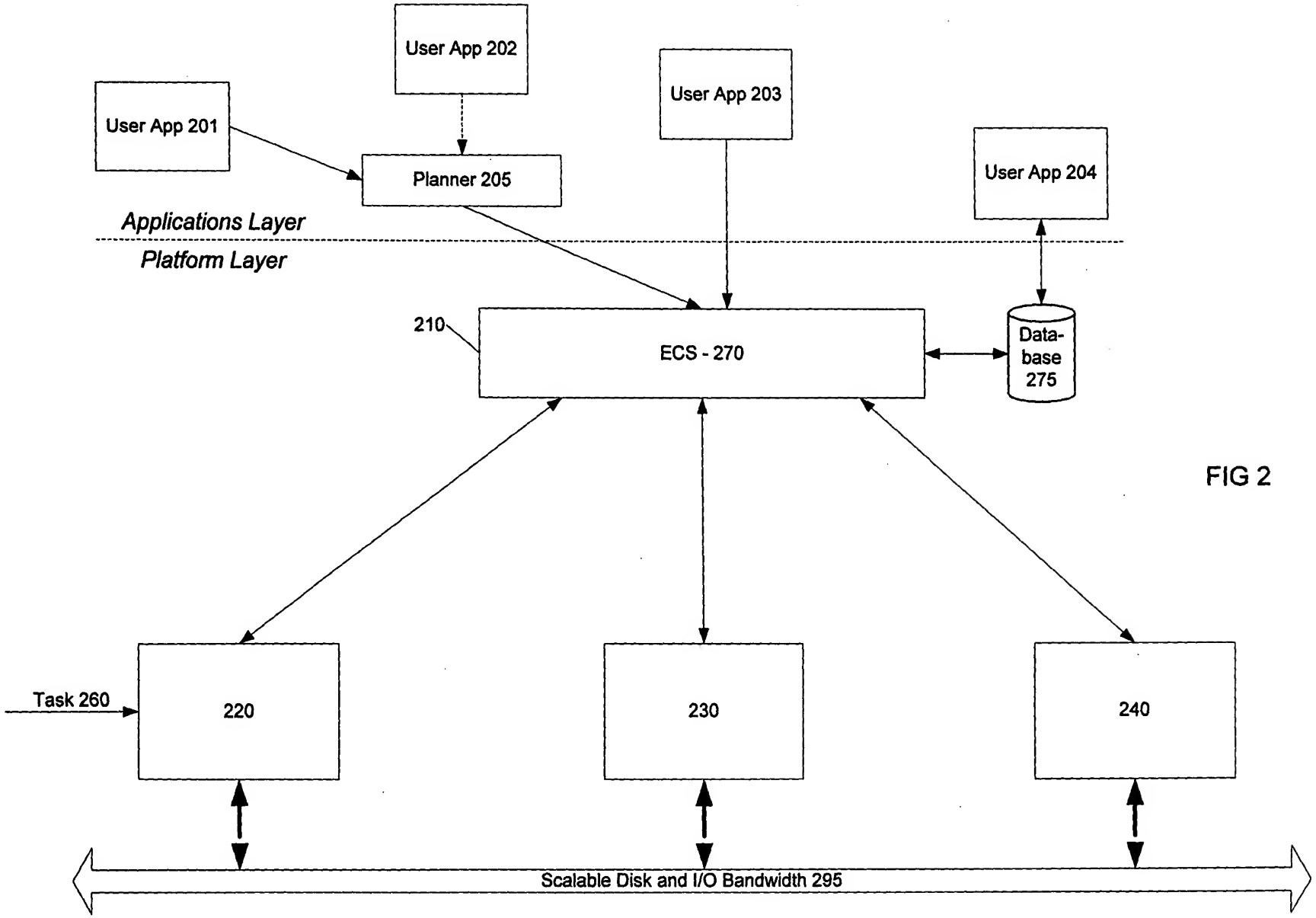
User App 202
User App 201
User App 203
User App 204
Planner 205
Applications Layer
Platform Layer
210
ECS - 270
Data-
base
275
Task 260
220
230
240
Scalable Disk and I/O Bandwidth 295

FIG 2

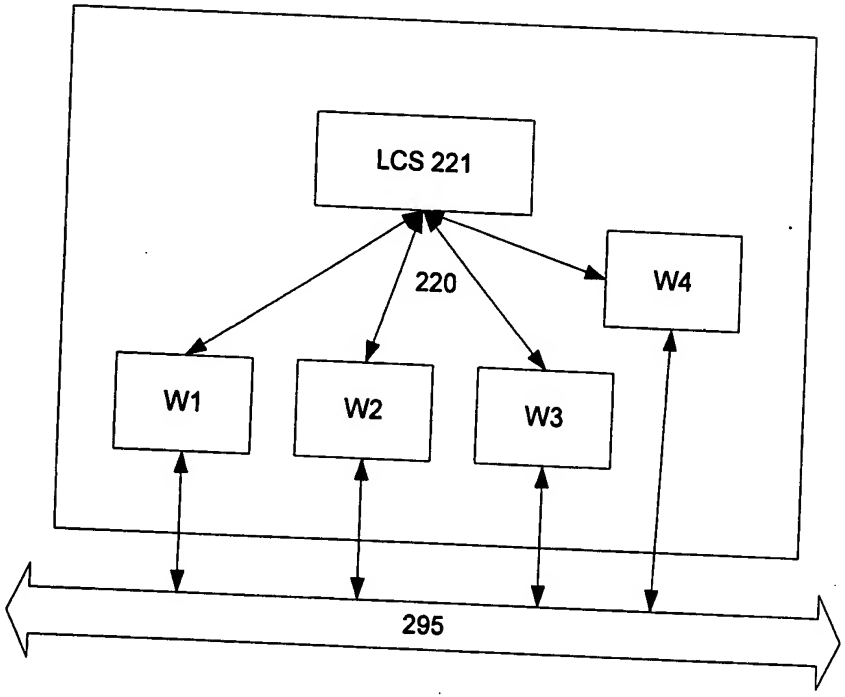
LCS 221
220
W4
W1
W2
W3
295

Fig 3A

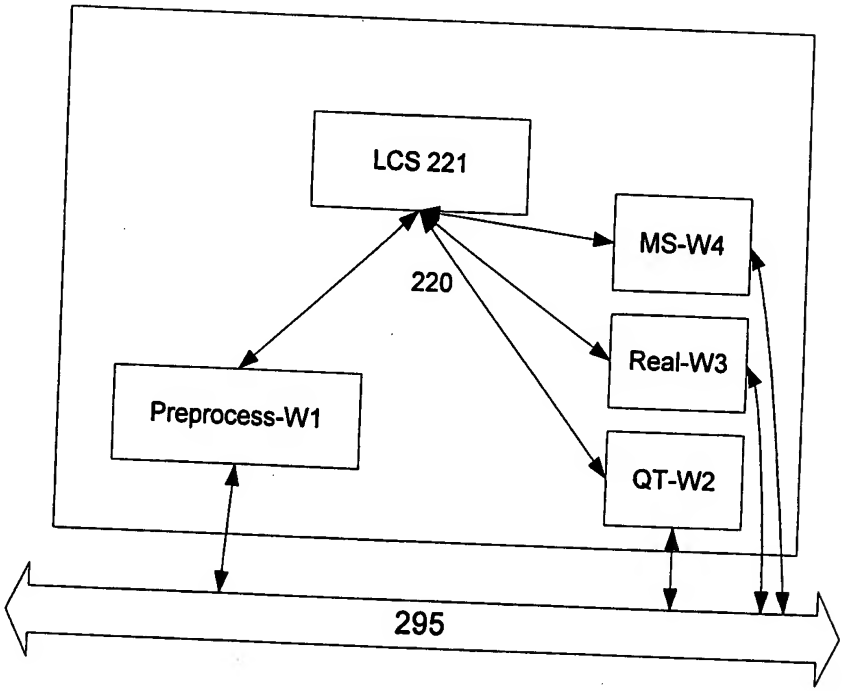
LCS 221
220
MS-W4
Real-W3
Preprocess-W1
QT-W2
295

Fig 3B

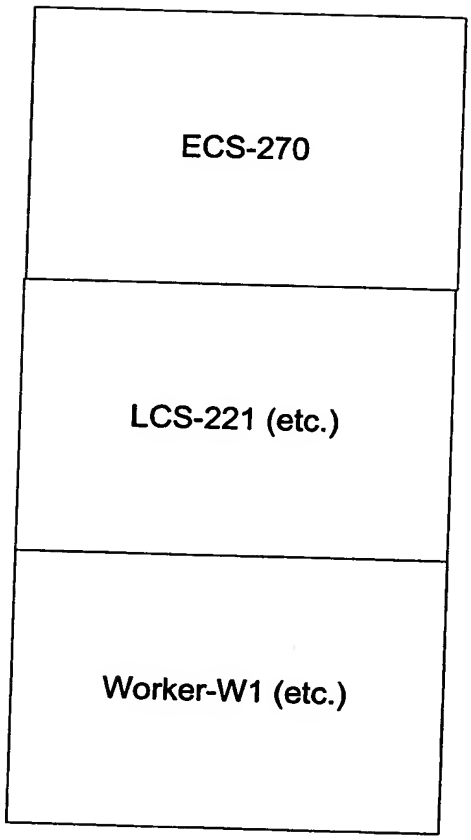

Fig. 4

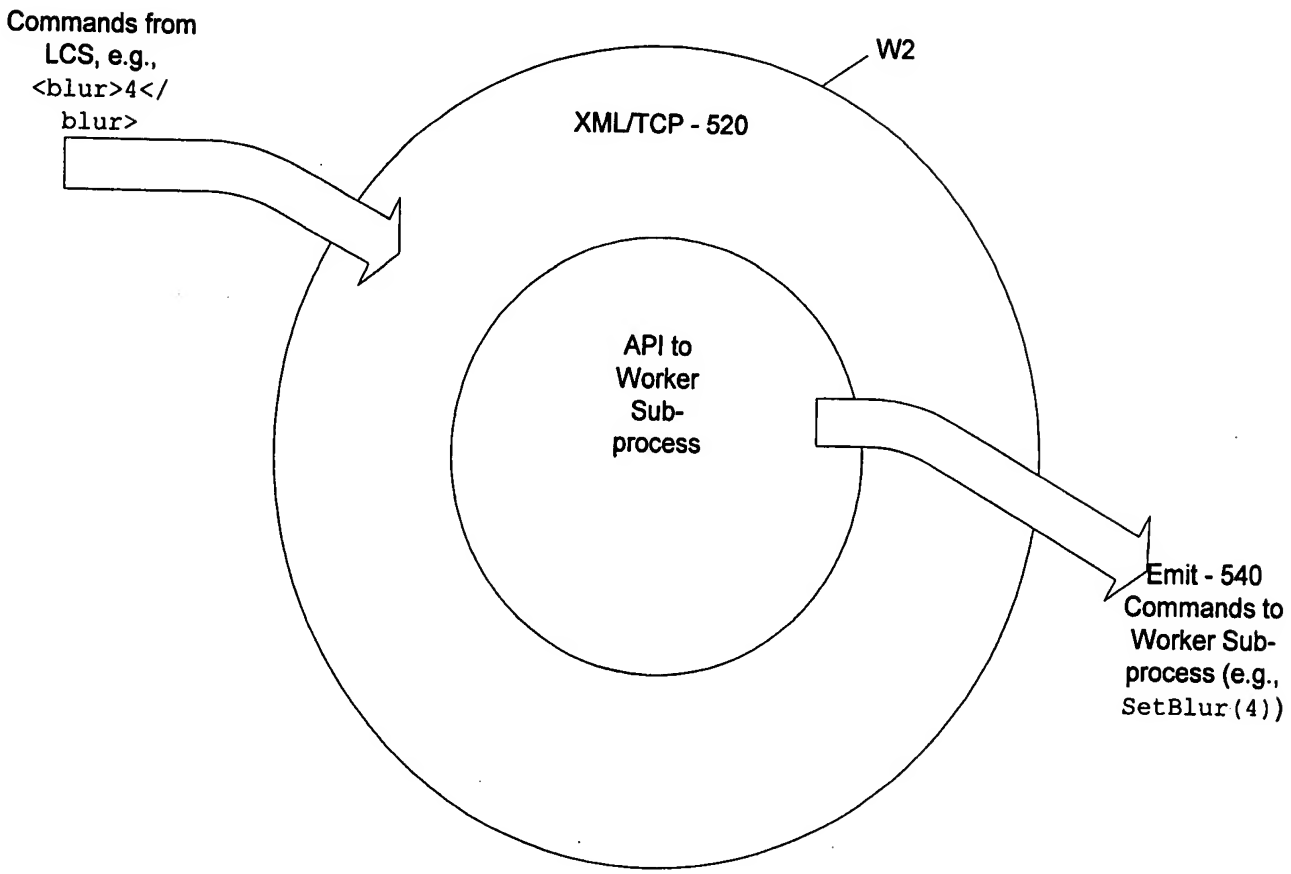
Commands from LCS, e.g., <blur>4</blur>
W2
XML/TCP - 520
API to Worker Sub-process
Emit - 540 Commands to Worker Sub-process (e.g., SetBlur(4))

Fig. 5

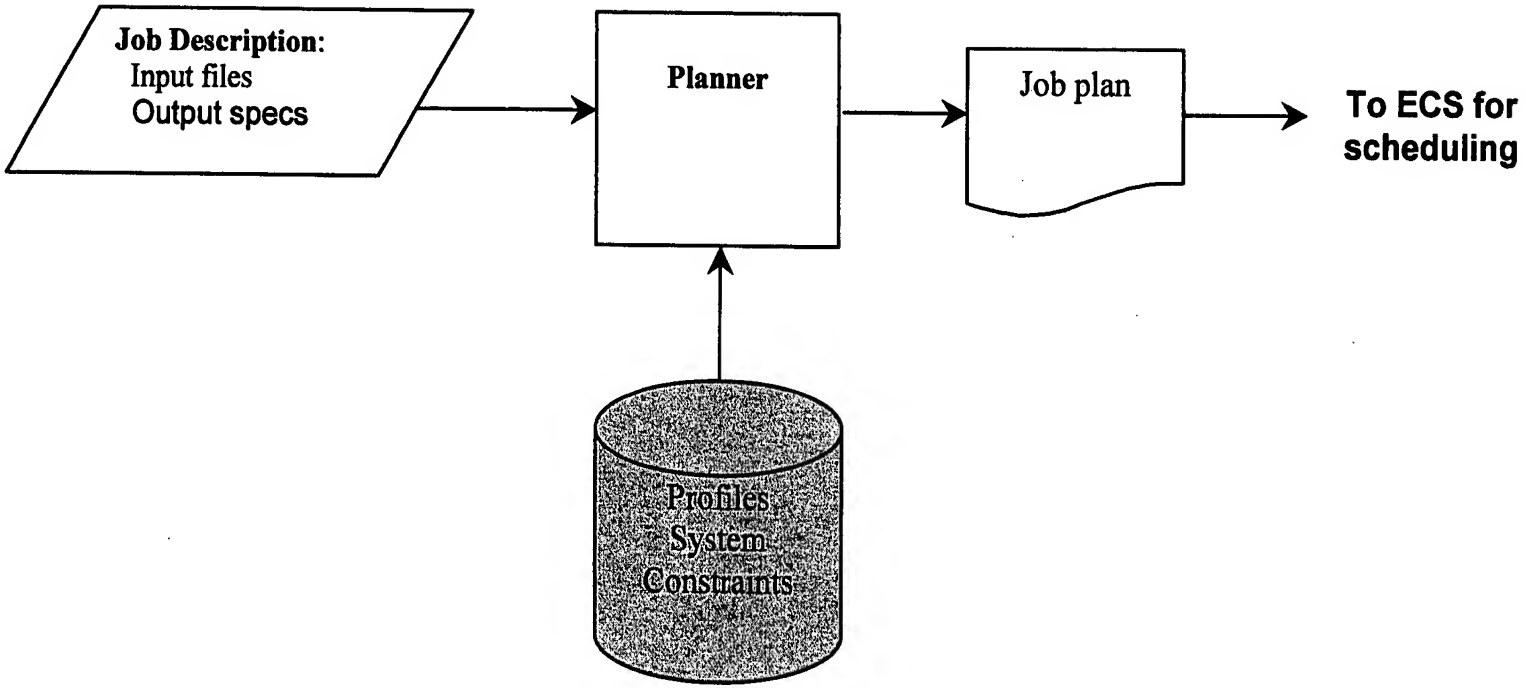
Job Description:
Input files
Output specs
Planner
Job plan
To ECS for scheduling
Profiles
System
Constraints

Fig. 6

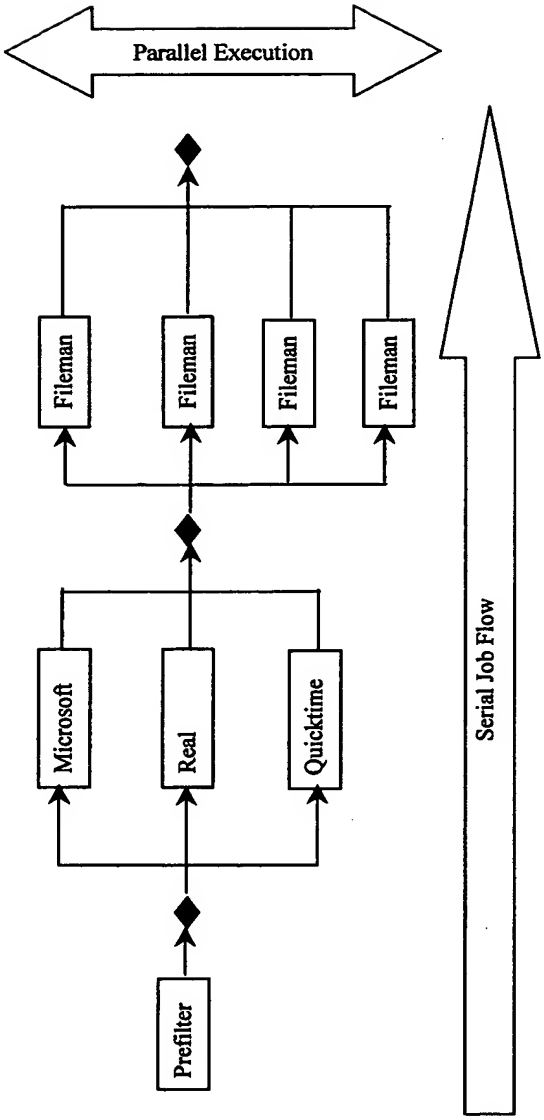
Parallel Execution
Fileman
Fileman
Fileman
Fileman
Microsoft
Real
Quicktime
Prefilter
Serial Job Flow

Fig. 7A

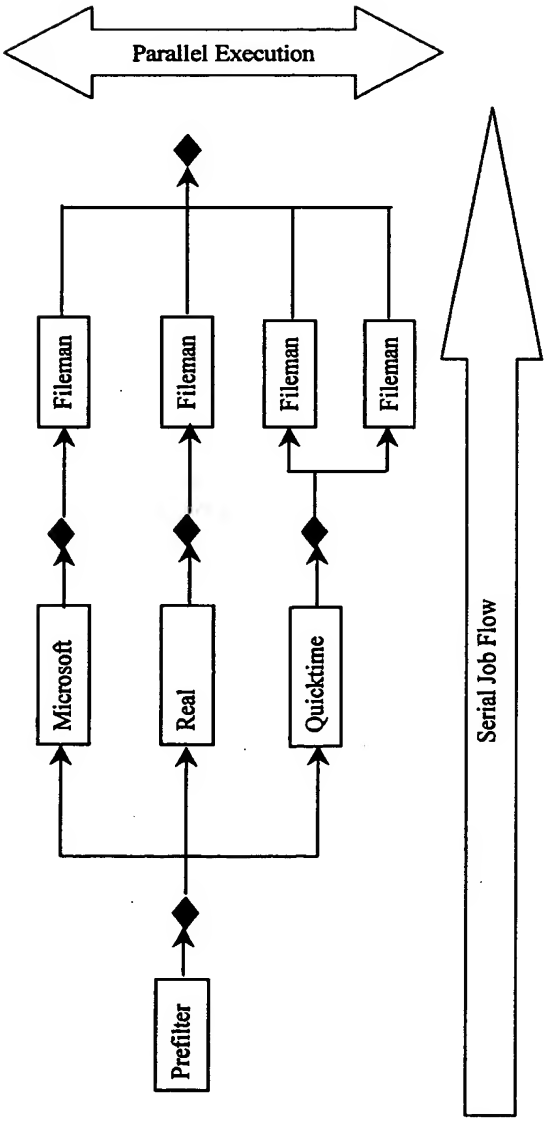
Parallel Execution
Fileman
Fileman
Fileman
Fileman
Microsoft
Real
Quicktime
Prefilter
Serial Job Flow

Fig. 7B

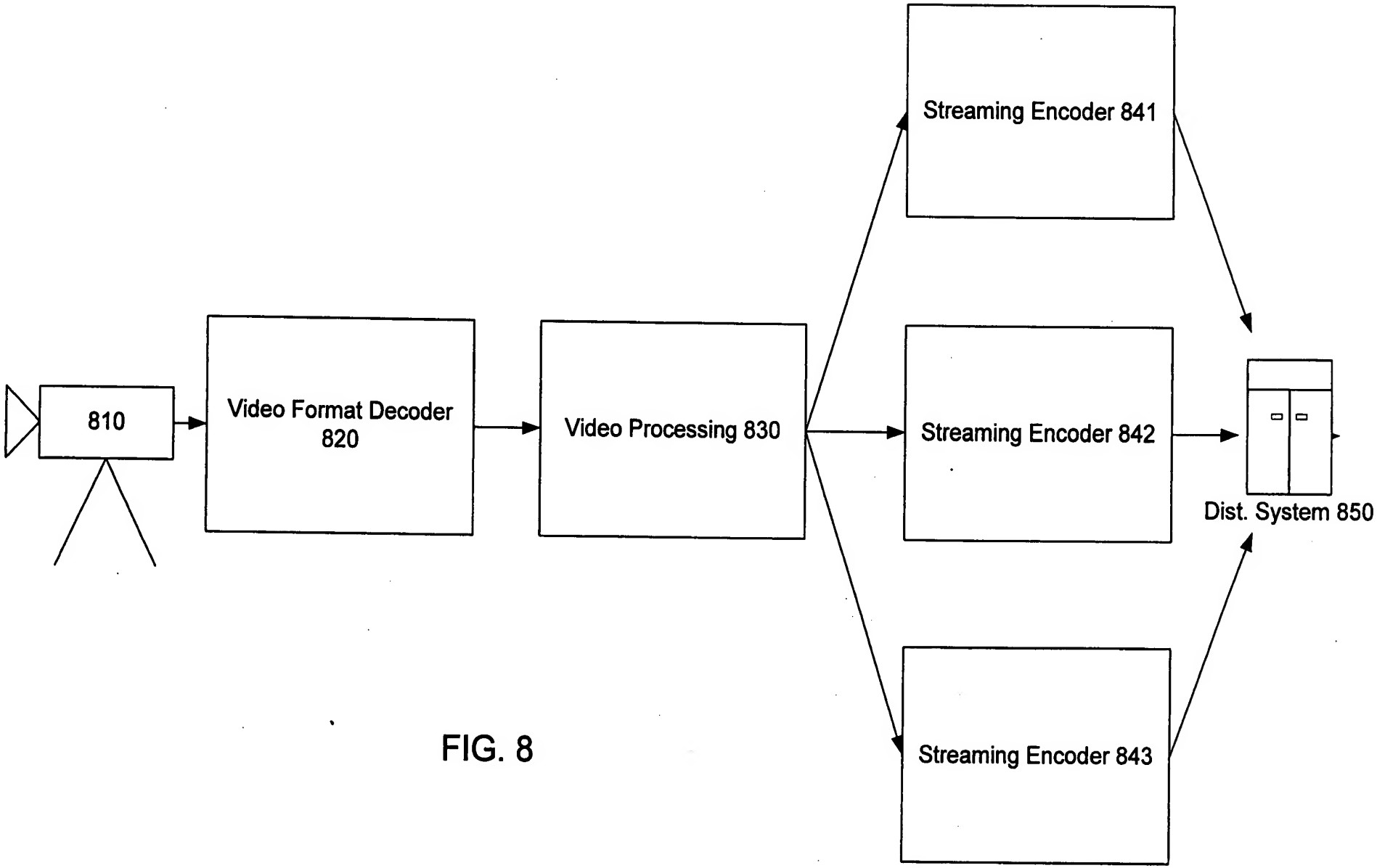
810
Video Format Decoder 820
Video Processing 830
Streaming Encoder 841
Streaming Encoder 842
Streaming Encoder 843
Dist. System 850

FIG. 8

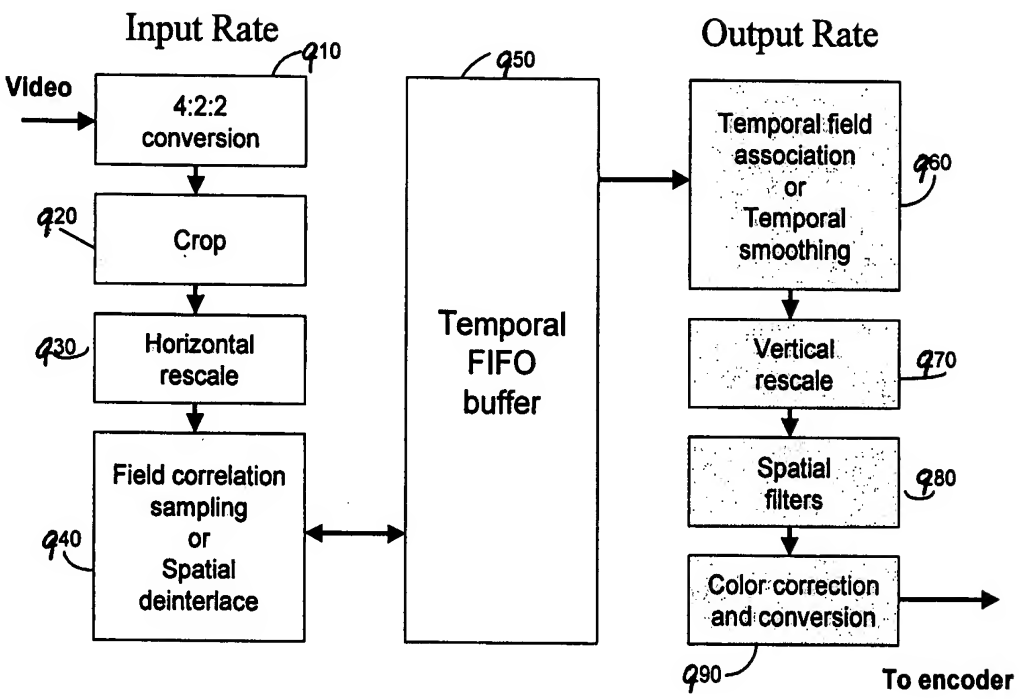
Input Rate
Output Rate
Video
4:2:2 conversion
Crop
Horizontal rescale
Field correlation sampling or Spatial deinterlace
Temporal FIFO buffer
Temporal field association or Temporal smoothing
Vertical rescale
Spatial filters
Color correction and conversion
To encoder
10
20
30
40
50
60
70
80
90

FIG. 9

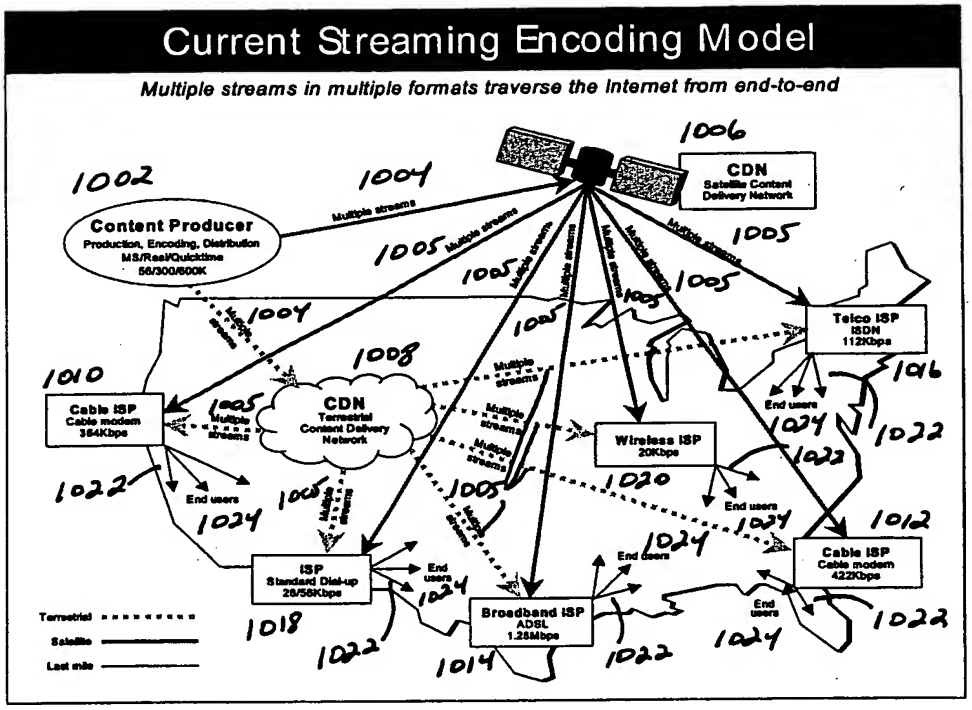

Figure 10 (prior art)

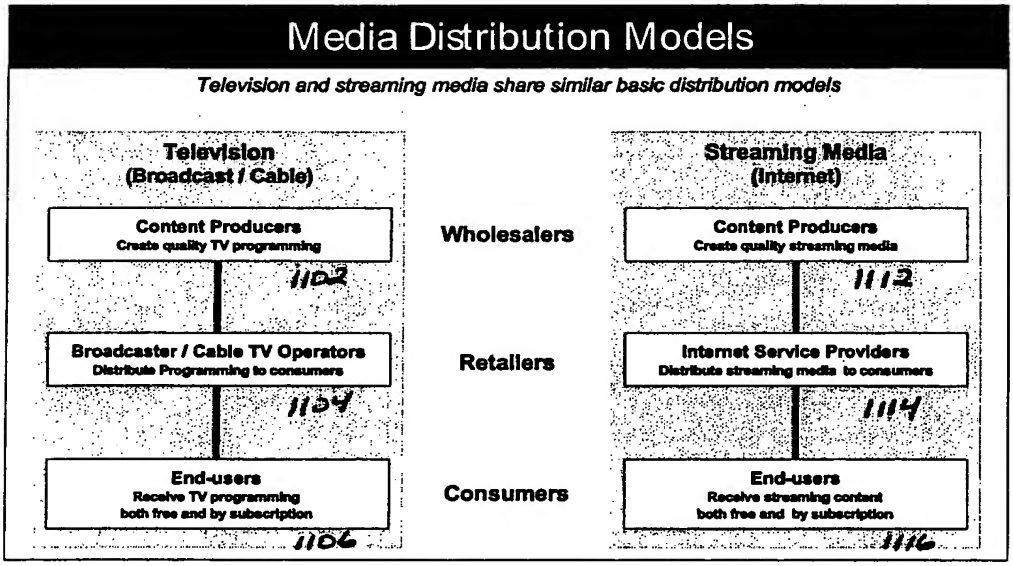

Fig. 11 (prior art)

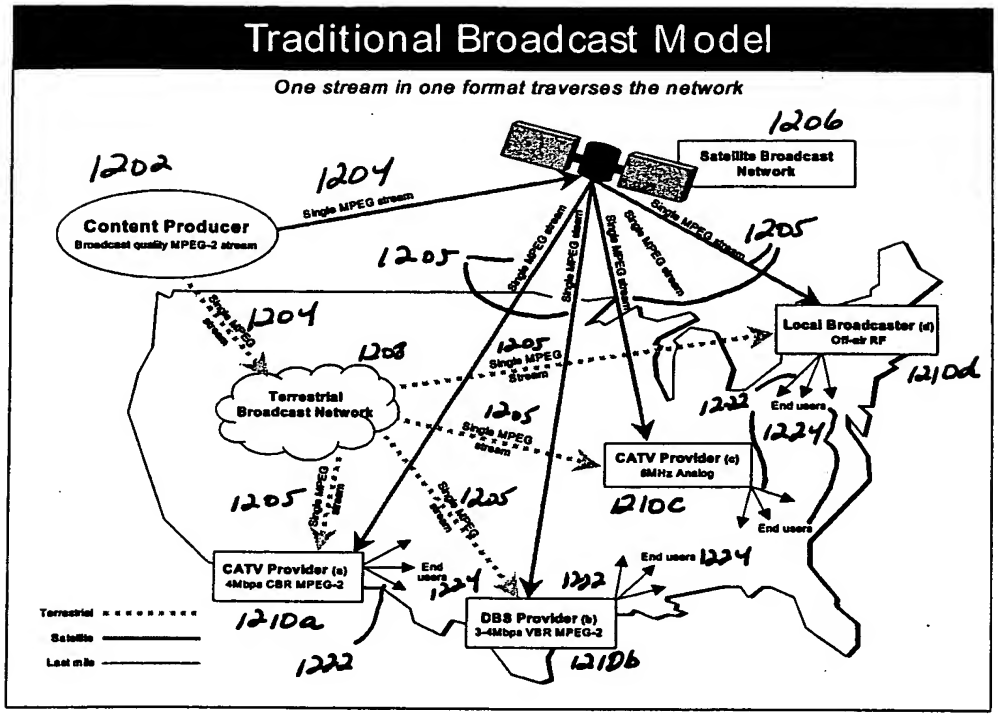

Fig. 12 (prior art)

Media Economic Models

Cost and revenue distribution differs significantly between television and streaming media

Television (Broadcast / Cable)				Streaming Media (Internet)		
Costs	**Revenue**	**Stakeholder**		**Stakeholder**	**Revenue**	**Costs**
Yes Produce programming & encode single MPEG stream -Pay for transport	**Yes** Sell Programming to Broadcast / Cable	1302 **Content Producers** Create quality TV programming	**Wholesalers**	1312 **Content Producers** Create quality streaming media	**No** All revenue is [illegible]	**Yes** -Produce programming & encode multiple streams, -Pay for transport
Yes Infrastructure	**Yes** Sell Bandwidth to Content Producer	1304 **Satellite & Terrestrial Delivery** Distribute Programming to Broadcast / Cable	**Transport**	1314 **Satellite & Terrestrial CDN's** Distribute streaming media to ISP's	**Restricted** Sell Bandwidth to [illegible]	**Yes** Infrastructure
Yes Pay wholesale price for programming	**Yes** Subscription revenue (cable/DBS) Ad revenue - local and/or national (ad)	1306 **Broadcaster / Cable TV / DBS Operators** Distribute Programming to consumers	**Retailers**	1316 **Internet Service Providers** Distribute streaming media to consumers	**No** Access revenue not directly related to streaming media	**Yes** Infrastructure
Yes Pay subscription fees for programming (cable/DBS)	**N/A**	1308 **End-users** Receive TV programming both free and subscription	**Consumers**	1318 **End-users** Receive streaming content both free and subscription	**N/A**	**No**
Yes Pay for ad time	**Indirect**	1310 **Advertisers** (local & national) Purchase ad time to run during network programming	**Advertisers**	1320 **Advertisers** Minimal advertising is not connected to streaming / no localization	**No** Advertising not directly linked to streaming media	**No** Advertising not directly linked to streaming media

Fig. 13 (prior art)

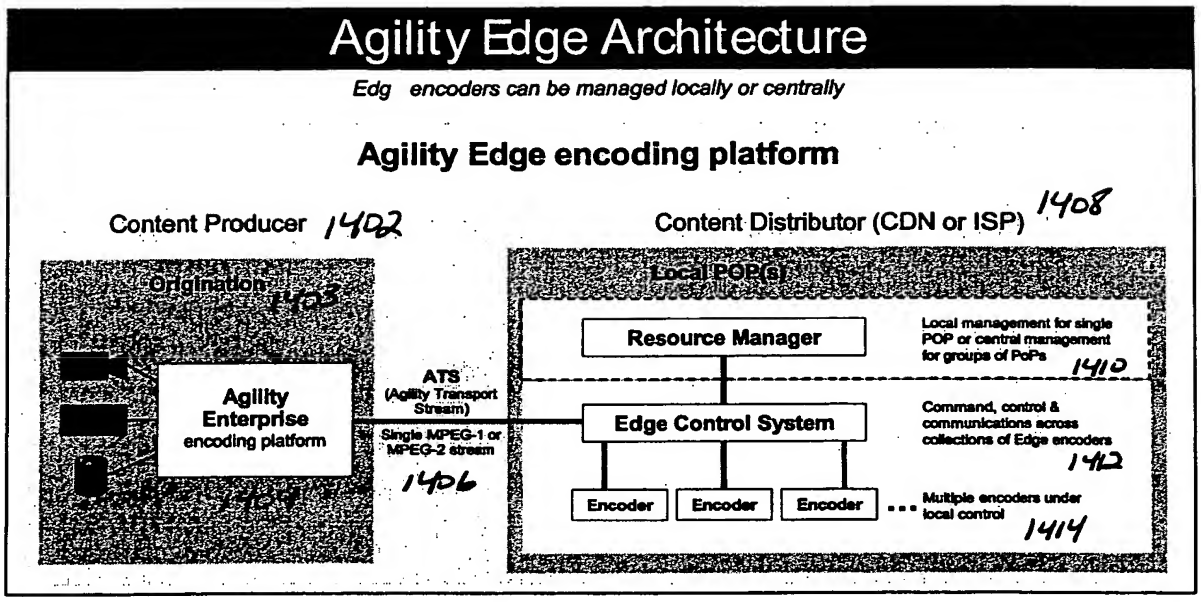
Agility Edge Architecture
Edg encoders can be managed locally or centrally
Agility Edge encoding platform
Content Producer 1402
Content Distributor (CDN or ISP) 1408
Origination 1403
Agility Enterprise encoding platform
ATS (Agility Transport Stream)
Single MPEG-1 or MPEG-2 stream
1406
Local POP(s)
Resource Manager
Local management for single POP or central management for groups of PoPs
1410
Edge Control System
Command, control & communications across collections of Edge encoders
1412
Encoder
Encoder
Encoder
Multiple encoders under local control
1414

Fig. 14

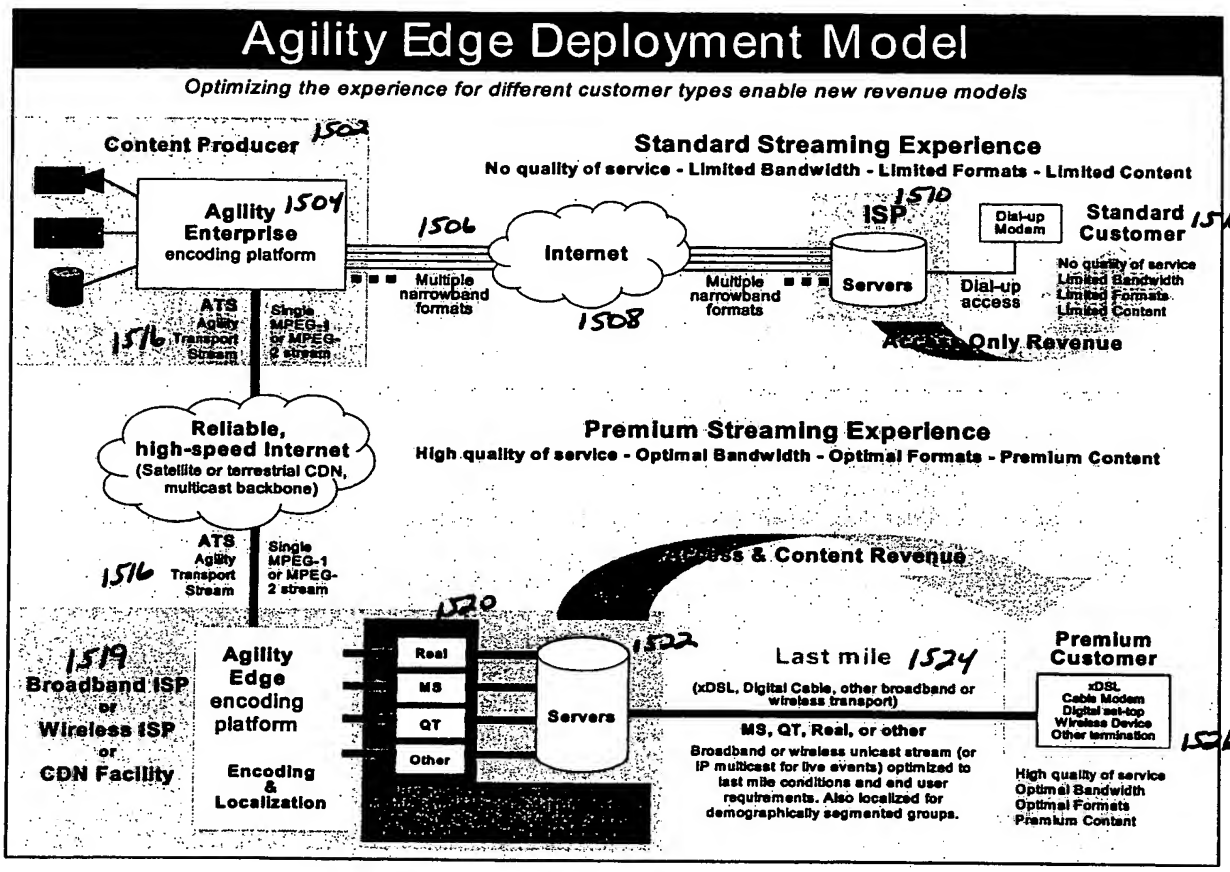
Agility Edge Deployment Model
Optimizing the experience for different customer types enable new revenue models
Content Producer
1502
Agility Enterprise encoding platform
1504
1506
Internet
1508
Multiple narrowband formats
Multiple narrowband formats
ISP
1510
Servers
Dial-up Modem
Dial-up access
Standard Customer
1512
No quality of service
Limited Bandwidth
Limited Formats
Limited Content
Standard Streaming Experience
No quality of service - Limited Bandwidth - Limited Formats - Limited Content
Only Revenue
ATS Agility Transport Stream
1516
Single MPEG-1 or MPEG-2 stream
Reliable, high-speed Internet
(Satellite or terrestrial CDN, multicast backbone)
Premium Streaming Experience
High quality of service - Optimal Bandwidth - Optimal Formats - Premium Content
& Content Revenue
1519
Broadband ISP
or
Wireless ISP
or
CDN Facility
Agility Edge encoding platform
Encoding & Localization
1520
Real
MS
QT
Other
Servers
1522
Last mile
1524
(xDSL, Digital Cable, other broadband or wireless transport)
MS, QT, Real, or other
Broadband or wireless unicast stream (or IP multicast for live events) optimized to last mile conditions and end user requirements. Also localized for demographically segmented groups.
Premium Customer
xDSL
Cable Modem
Digital set-top
Wireless Device
Other termination
1526
High quality of service
Optimal Bandwidth
Optimal Formats
Premium Content

Fig. 15

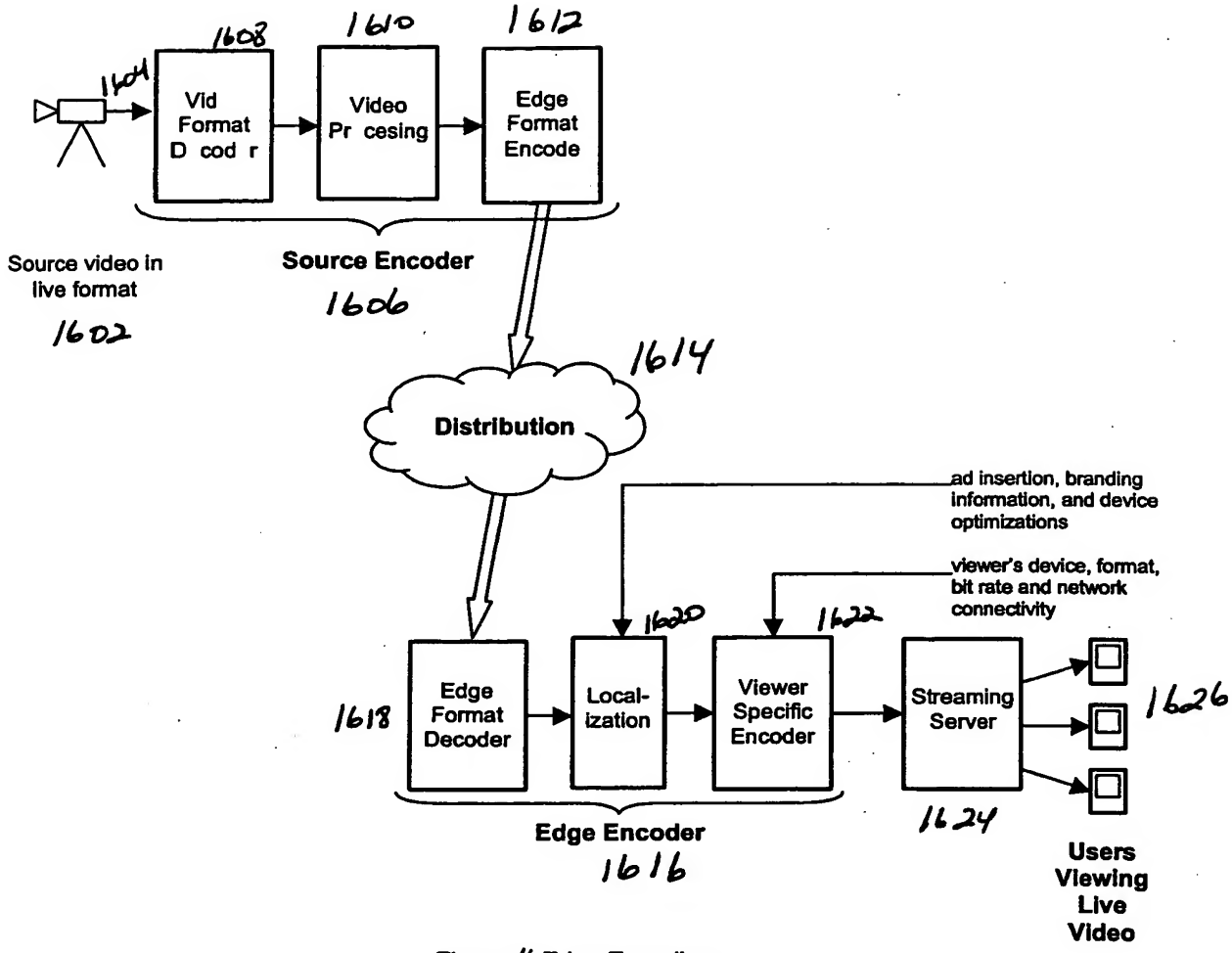

Figure 16 Edge Encoding

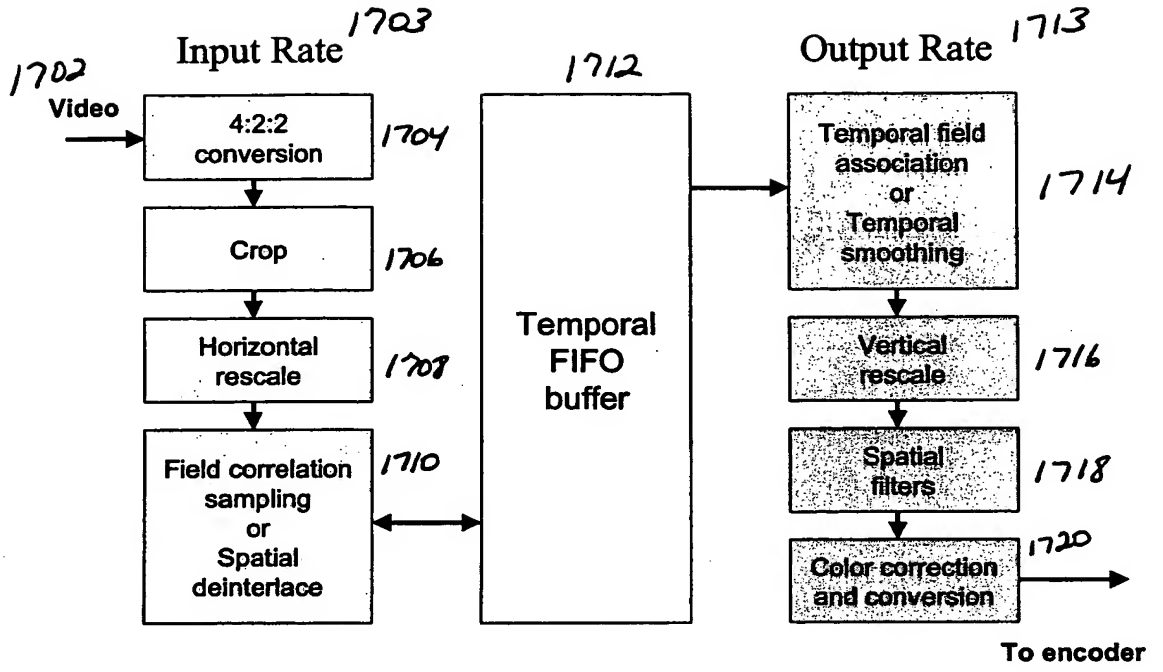

Fig. 17 — Video Preprocessing Flowchart

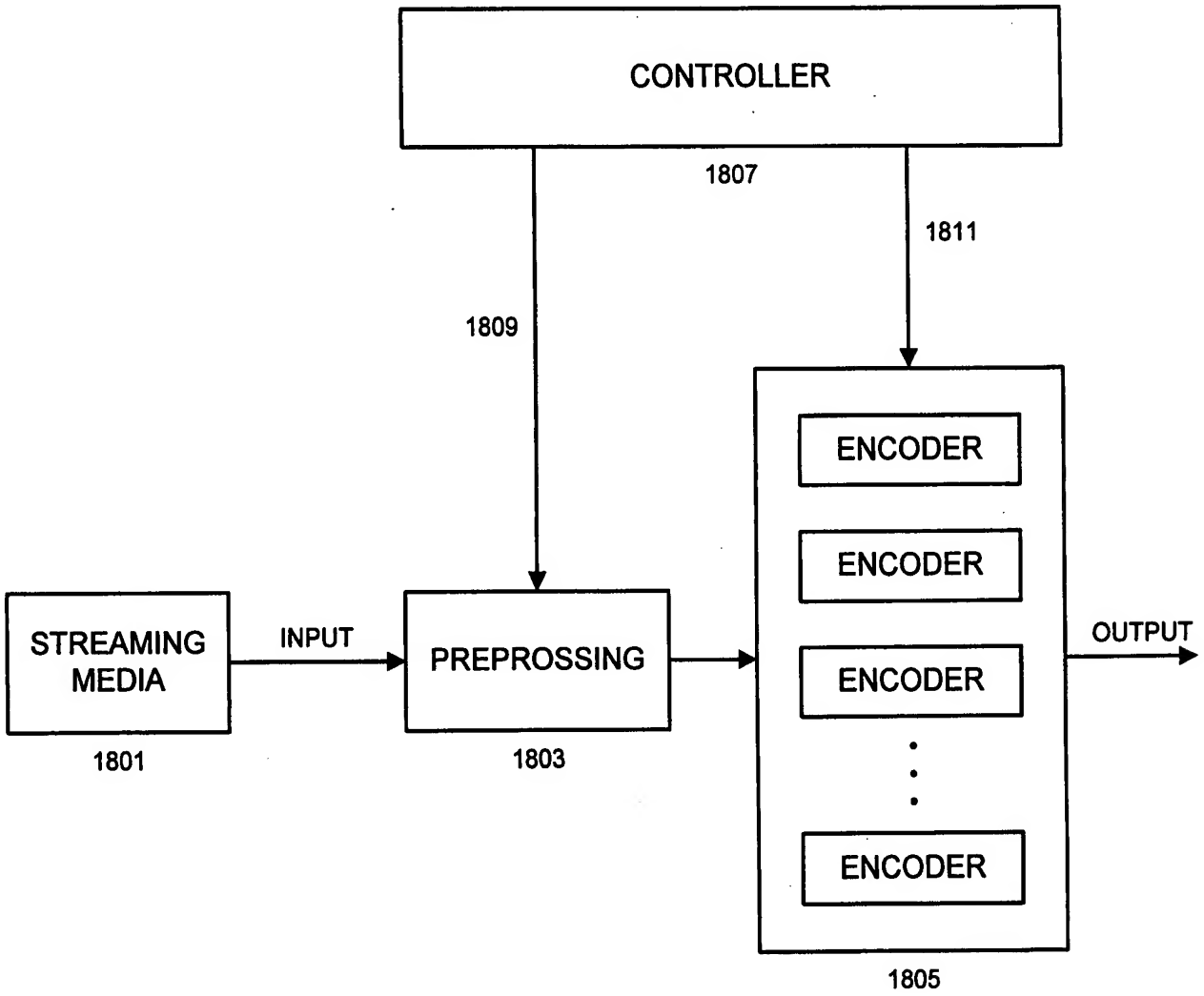
CONTROLLER
1807
1811
1809
ENCODER
ENCODER
ENCODER
ENCODER
STREAMING MEDIA
INPUT
PREPROSSING
OUTPUT
1801
1803
1805

Figure 18